

## LISTING OF THE CLAIMS

Claims 1- 49 were originally pending. Please amend claims 2-6, 8-16, 18 - 22, 24-34 and 36-40. Kindly cancel claims 1, 7-8, 17, 23, 30, 35 and 41-49 without prejudice. No claims are added or withdrawn. Accordingly, claims 2-6, 9-16, 18-22, 24- 29, 31-34 and 36-40 remain pending.

1. (Canceled).
2. (Currently amended) A The method of ~~as-recited-in~~ claim 9 1, wherein the set of non-enhanced documents is not an empty set.
3. (Currently amended) A The method of ~~as-recited-in~~ claim 9 1, wherein term(s) of the search query pertain to a product research and/or product troubleshooting.
4. (Currently amended) A The method of ~~as-recited-in~~ claim 9 1, wherein the base document is a knowledge base, product help, and/or developer targeted article.
5. (Currently amended) A The method of ~~as-recited-in~~ claim 9 1, wherein the one or more different documents comprise one or more service request(s), newsgroup posting(s), and/or search query log(s).

6. (Currently amended) A The method of as recited in claim 9 4, wherein the one or more respective references to the base document comprise a link and/or a substantially unique documents identifier associated with the base document.

7-8. (Canceled)

9. (Currently amended) ~~A method as recited in claim 7, A method implemented by a computing device for enhanced document retrieval, the method comprising:~~

receiving a search query from an end-user;

responsive to receiving the search query, retrieving search results, the search results comprising an enhanced document and a set of non-enhanced documents, the enhanced document and the non-enhanced documents including term(s) of the search query;

wherein the enhanced document is derived from a base document, the base document having been modified with metadata mined from one or more different documents, the metadata being associated with one or more respective references to the base document, the metadata including one or more of a title of a document, product problem context, and a product problem resolution information, the one or more different documents being independent of the base document;

wherein the method further comprises calculating term proximity to determine relevance of the enhanced document as follows:

$$Sim = Sim_{orig} * proximity,$$

$$proximity = \frac{\log(1 + \alpha(\beta * Hit + (1 - \beta) * (1 - EditDistance)))}{\log(1 + \alpha)},$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query,  $Hit$  represents a percentage of the terms in a document in a database over all terms, the database comprising the one or more documents, and  $EditDistance$  represents a misorder between the search query and the document; and

returning ranked search results for presentation to the end-user, the ranked search resulting being ranked as a function of the relevance.

10. (Currently amended) A The method of ~~as recited in~~ claim 9, wherein the method further comprises calculating popularity as follows:

$$popularity = \frac{\log(1 + \alpha(\beta * I_{ref} + (1 - \beta) * (1 - I_{age})))}{\log(1 + \alpha)},$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query,  $I_{ref}$  represents an importance from frequency of reference, and  $I_{age}$  represents an age of a document from a database associated with the base document, the document comprising at least a subset of the terms and/or keywords.

11. (Currently amended) A The method of ~~as recited in~~ claim 11, wherein  $I_{ref}$  and  $I_{age}$  are determined as follows:

$$I_{ref} = 0.5 + 0.5 \frac{\text{freq(ref)}}{\text{max freq(ref)}}; \text{ and}$$

$$I_{age} = \frac{1}{1 + e^{age}} .$$

12. (Currently amended) A The method of as-recited in claim 9 ~~7~~, wherein after determining the relevance and before returning the ranked results, the method further comprises:

creating a respective snippet description for each result of the top-ranked results, the snippet description indicating significance of the result in view of term(s) of the search query; and

wherein the ranked search results comprise the respective snippet description for each result of the top-ranked results.

13. (Currently amended) A The method of as-recited in claim 12, wherein creating further comprises:

locating one or more blocks from a retrieved document in the top-ranked search results; and

highlighting term(s) of the search query in the one or more blocks.

14. (Currently amended) A The method of as-recited in claim 13, wherein locating further comprises:

identifying the one or more blocks with a sliding window of configurable size that is applied to portions of the retrieved document;

measuring an amount of query-related information carried by text delineated by the sliding window, the measure being based on quantitative criteria

such as word frequency, word proximity to a query term, and/or word position; and

combining the quantitative criteria with a trained classifier to identify a substantially most informative block for the snippet description.

15. (Currently amended) A The method of ~~as-recited-in~~ claim 14, wherein the configurable size is a function of client computing device user interface space available for display of the snippet description.

16. (Currently amended) A The method of ~~as-recited-in~~ claim 14, wherein the trained classifier is trained with linear regression as a function of:

$$y = b_0 + \sum_{j=1}^p b_j x_j + e$$

wherein  $x$  is a vector,  $y$  is a value of a straight line to fit value(s) associated with the quantitative criteria, "residual"  $e$  is a random variable with mean zero, coefficients  $b_j$  are determined by a condition that a sum of a square residual is small, variables  $x_j$  are inputs such as log or polynomial of inputs.

17. (Canceled).

18. (Currently amended) A The computer-readable medium of ~~as-recited in claim 24~~ 17, wherein the set of non-enhanced documents is not an empty set.

19. (Currently amended) ~~A~~ The computer-readable medium of as recited in claim 24 ~~47~~, wherein the base document is a knowledge base, product help, and/or developer targeted article.

20. (Currently amended) ~~A~~ The computer-readable medium of as recited in claim 24 ~~47~~, wherein the one or more different documents comprise one or more service request(s), newsgroup posting(s), and/or search query log(s).

21. (Currently amended) ~~A~~ The computer-readable medium of as recited in claim 24 ~~47~~, wherein the one or more respective references to the base document comprise a link and/or a substantially unique documents identifier associated with the base document.

22. (Currently amended) ~~A~~ The computer-readable medium of as recited in claim 24 ~~47~~, wherein the metadata is semantically and/or contextually related to associated ones of the one or more documents.

23. (Canceled)

24. (Currently amended) ~~A computer-readable medium as recited in claim 23, A tangible computer-readable medium comprising computer-program instructions executable by a processor to provide content propagation for enhanced document retrieval, the computer-program instructions when executed by a processor, performing operations comprising:~~

receiving a search query from an end-user;

responsive to receiving the search query, retrieving search results, the search results comprising an enhanced document and a set of non-enhanced documents, the enhanced document and the non-enhanced documents including term(s) of the search query, the enhanced document being derived from a base document, the base document having been modified with metadata mined from one or more different documents, the metadata being associated with one or more respective references to the base document, the one or more different documents being independent of the base document;

~~wherein the instructions further comprise instructions for calculating term proximity as follows:~~

$$Sim = Sim_{orig} * proximity,$$

$$proximity = \frac{\log(1 + \alpha(\beta * Hit + (1 - \beta) * (1 - EditDistance)))}{\log(1 + \alpha)}$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query, *Hit* represents a percentage of the terms in a document in a database over all terms, the database comprising the one or more documents, and EditDistance represents a misorder between the search query and the document;

determining relevance of the enhanced document and the set of non-enhanced documents in view of the term proximity and search query popularity criteria;

returning ranked search results for presentation to the end-user, the ranked search resulting being ranked as a function of the relevance.

25. (Currently amended) ~~A computer-readable medium as recited in claim 23, A tangible computer-readable medium comprising computer-program instructions executable by a processor to provide content propagation for enhanced document retrieval, the computer-program instructions when executed by a processor, performing operations comprising:~~

receiving a search query from an end-user;

responsive to receiving the search query, retrieving search results, the search results comprising an enhanced document and a set of non-enhanced documents, the enhanced document and the non-enhanced documents including term(s) of the search query, the enhanced document being derived from a base document, the base document having been modified with metadata mined from one or more different documents, the metadata being associated with one or more respective references to the base document, the one or more different documents being independent of the base document;

~~wherein the instructions further comprise instructions for calculating popularity as follows:~~

$$popularity = \frac{\log(1 + \alpha(\beta * I_{ref} + (1 - \beta) * (1 - I_{age})))}{\log(1 + \alpha)},$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query,  $I_{ref}$  represents an importance from frequency of reference, and  $I_{age}$  represents an age of a document from a database associated with the base document, the document comprising at least a subset of the terms and/or keywords;



determining relevance of the enhanced document and the set of non-enhanced documents in view of search query term proximity criteria and the popularity;

returning ranked search results for presentation to the end-user, the ranked search resulting being ranked as a function of the relevance.

26. (Currently amended) A The computer-readable medium of as-recited in claim 25 23, wherein after determining the relevance and before returning the ranked results, the instructions further comprise instructions for:

creating a respective snippet description for each result of the top-ranked results, the snippet description indicating significance of the result in view of term(s) of the search query; and

wherein the ranked search results comprise the respective snippet description for each result of the top-ranked results.

27. (Currently amended) A The computer-readable medium of as-recited in claim 26, wherein the instructions for creating further comprise instructions for:

locating one or more blocks from a retrieved document in the top-ranked search results; and

highlighting term(s) of the search query in the one or more blocks.

28. (Currently amended) A The computer-readable medium of as-recited in claim 27, wherein the instructions for locating further comprise instructions for:

identifying the one or more blocks with a sliding window of configurable size that is applied to portions of the retrieved document;

measuring an amount of query-related information carried by text delineated by the sliding window, the measure being based on quantitative criteria such as word frequency, word proximity to a query term, and/or word position; and

combining the quantitative criteria with a trained classifier to identify a substantially most informative block for the snippet description.

29. (Currently amended) A The computer-readable medium ~~of as recited~~ in claim 28, wherein the configurable size is a function of client computing device user interface space available for display of the snippet description.

30. (Canceled).

31. (Currently amended) A The computing device ~~of as recited~~ in claim ~~37~~ 30, wherein the set of non-enhanced documents is not an empty set.

32. (Currently amended) A The computing device ~~of as recited~~ in claim ~~37~~ 30, wherein the base document is a knowledge base, product help, and/or developer targeted article.

33. Currently amended) A The computing device of ~~as recited in claim 37-39~~, wherein the one or more different documents comprise one or more service request(s), newsgroup posting(s), and/or search query log(s).

34. Currently amended) A The computing device of ~~as recited in claim 37-39~~, wherein the one or more respective references to the base document comprise a link and/or a substantially unique documents identifier associated with the base document.

35. (Canceled).

36. (Original) ~~A computing device as recited in claim 35~~, A computing device for enhanced document retrieval, the computing device comprising:

a processor; and

a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for:

receiving a search query from an end-user;

responsive to receiving the search query, retrieving search results, the search results comprising an enhanced document and a set of non-enhanced documents, the enhanced document and the non-enhanced documents including term(s) of the search query, the enhanced document being derived from a base document, the base document having been modified with metadata mined from one or more different documents, the metadata being associated with one or more

respective references to the base document, the one or more different documents being independent of the base document;

~~wherein the instructions further comprise instructions for calculating term proximity as follows:~~

$$\begin{aligned} Sim &= Sim_{orig} * proximity, \\ proximity &= \frac{\log(1 + \alpha(\beta * Hit + (1 - \beta) * (1 - EditDistance)))}{\log(1 + \alpha)} \end{aligned}$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query, *Hit* represents a percentage of the terms in a document in a database over all terms, the database comprising the one or more documents, and EditDistance represents a misorder between the search query and the document;

determining relevance of the enhanced document and the set of non-enhanced documents in view of the term proximity and search query popularity criteria; and

returning ranked search results for presentation to the end-user, the ranked search resulting being ranked as a function of the relevance.

37. (Currently amended) ~~A computing device as recited in claim 35,~~  
~~wherein the instructions further comprise instructions for~~

A computing device for enhanced document retrieval, the computing device comprising:

a processor; and

a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for:

receiving a search query from an end-user;

responsive to receiving the search query, retrieving search results, the search results comprising an enhanced document and a set of non-enhanced documents, the enhanced document and the non-enhanced documents including term(s) of the search query, the enhanced document being derived from a base document, the base document having been modified with metadata mined from one or more different documents, the metadata being associated with one or more respective references to the base document, the one or more different documents being independent of the base document;

calculating popularity as follows:

$$popularity = \frac{\log(1 + \alpha(\beta * I_{ref} + (1 - \beta) * (1 - I_{age})))}{\log(1 + \alpha)},$$

wherein  $\alpha$ ,  $\beta$  are parameters configured to control relative weight of each part of the search query,  $I_{ref}$  represents an importance from frequency of reference, and  $I_{age}$  represents an age of a document from a database associated with the base document the document comprising at least a subset of the terms and/or keywords;

determining relevance of the enhanced document and the set of non-enhanced documents in view of the search query term proximity criteria and the popularity; and

returning ranked search results for presentation to the end-user, the ranked search resulting being ranked as a function of the relevance.

38. (Currently amended) A The computing device of as recited in claim 36-35, wherein after determining the relevance and before returning the ranked results, the instructions further comprise instructions for:

creating a respective snippet description for each result of the top-ranked results, the snippet description indicating significance of the result in view of term(s) of the search query; and

wherein the ranked search results comprise the respective snippet description for each result of the top-ranked results.

39. (Currently amended) A The computing device of as recited in claim 38, wherein the instructions for creating further comprise instructions for:

locating one or more blocks from a retrieved document in the top-ranked search results; and

highlighting term(s) of the search query in the one or more blocks.

40. (Currently amended) A The computing device of as recited in claim 39, wherein the instructions for locating further comprise instructions for:

identifying the one or more blocks with a sliding window of configurable size that is applied to portions of the retrieved document;

measuring an amount of query-related information carried by text delineated by the sliding window, the measure being based on quantitative criteria such as word frequency, word proximity to a query term, and/or word position; and

combining the quantitative criteria with a trained classifier to identify a substantially most informative block for the snippet description.

41-49. (Canceled).